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VENOUS INJECTION OF MERCURIC
CHLORID.

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THE object of this paper is to present a new treatment of syphilis, which has been particularly successful in the hands of Italian physicians for the past two years. Recent reports of syphilographers indicate a tendency to supersede the older methods of treating syphilis, such as by oral medication, baths, vapors, inunctions, etc., by some speedier and more certain method. Dr. L. Wolff, of Philadelphia,¹ in a very admirable paper, in which he has embodied reports from many Continental observers, proves conclusively that the hypodermic administration of the salts of mercury is not only a warrantable, but an advisable procedure, possessing decided advantages. It is naturally open to many objections, and has been fully discussed by competent critics. It is not in the province of this paper to reopen this discussion, but to describe a new method, which obviates many of the objections to the hypodermic injections; to give a dispassionate review of it, and to excerpt from reports of cases

¹ Therapeutic Gazette, May, 1894, p. 309.

from the Italian in which a thorough trial of the treatment has been made.

At the present time it is impossible to report any cases under personal observation, as a satisfactory or trustworthy report cannot be made until the treatment has been given at least several months' trial.

The intravenous injection of mercuric chlorid in the treatment of syphilis was originally suggested by Prof. Guido Baccelli,¹ of Rome, who had previously been quite successful in the treatment of the pernicious as well as the other forms of malarial fever by the intravenous injection of the salts of quinin. The good results obtained in this manner impressed Baccelli with the advantage of direct medication to the corpuscular elements of the blood in certain phases and types of disease. At first it was thought that the drug would cause coagulation of the blood, but experiments on the lower animals proved the contrary. Baccelli injected a dog intravenously, with a solution of mercuric chlorid, 1:1000, until five centigrams of the salt were injected in a single dose without subsequent toxic symptoms and only slight salivation. He then directed his experiments to the treatment of some obstinate cases of organic syphilis, which had resisted all other treatment, by the intravenous injection of mercuric chlorid 1:1000, commencing with doses of 0.001 gram. (equivalent to 1 gram of the solution) and progressively increasing the dose to .005 gram. His investigations met with the most brilliant results, and since then thorough investigation into the merits

¹ Gaz. med. di Roma, 1893, xix, 241-245.

and value of the method has been made by Baccelli, Jemna, Colombini, Nieddu, Campana, and many others throughout Italy.

In the preparation of the fluid for injection the following formula is used :

Mercuric chlorid	.	.	.	.	1	gram.
Sodium chlorid	.	.	.	.	3	grms.
Water	.	.	.	.	1000	grms.

A small quantity of alcohol may be added to facilitate solution. The mixture should be well stirred, and filtered until perfectly clear. It is advisable, but not necessary, to sterilize it, both to be perfectly aseptic and to facilitate solution.

A ligature is applied above the elbow, and any one of the superficial veins in the neighborhood, which soon become prominent, may be selected as the point for injection. The point selected and the surrounding area are then thoroughly scrubbed and disinfected with a 1 : 1000 solution of mercuric chlorid or a 5 per cent. solution of carbolic acid. The needle, previously sterilized, is plunged directly toward the center, at the point selected, and a few drops of blood allowed to ooze out, assuring entrance into the vein ; the barrel is carefully applied, avoiding any entrance of air.¹

Loosen the ligature and make the injection, at first using only one gram of the solution, and progressively increasing to four grams at a dose. Occasionally on the withdrawal of the needle there is some

¹ Recent experiment has shown that a small quantity of air can be injected intravenously into a rabbit without any harmful effect.

extravasation of blood into the neighboring subcutaneous tissue; but this is absorbed very quickly, and is only of occasional occurrence. Repeated injections can be made in the same vein. In a case reported by Jemma seventy-five injections were made in the median cephalic vein. This vein and the median basilic are the best to use.

There are two precautions that should be remembered: First, always use a fresh solution, which the physician should prepare himself, to be assured that the salt has not decomposed, which is often the case after the solution has been standing some time. No after-dressing is needed, and it is not necessary to cover the wound of puncture with collodion. Second, do not use a concentrated solution. That of 1:1000 is to be preferred, but in late injections a 1:500 solution may be used.

The following extracts of cases reported by Baccelli will convey the degree of usefulness of this treatment:

CASE I.—A man, twenty-eight years of age, contracted syphilis in February, 1890. He was first seen in February, 1892, two years after the appearance of the initial sign, with distressing symptoms of cerebral syphilis, and he was completely blind. From May until December, 1892, energetic treatment with van Swieten's solution, mercurial inunctions, potassium iodid, and hypodermic injections of calomel proved of no avail, and the symptoms remained the same, with only a slight alleviation of the persistent headache. In spite of this, the original diagnosis of a syphilitic tumor at the base of the brain was adhered to, and on January 3, 1893, the intravenous injections were begun. The initial dose

was one gram of the standard solution, which was gradually increased to five grams. On February 19th, after twenty-eight injections, all the other symptoms had disappeared, and the blindness, which was before complete, began progressively to improve.

CASE II.—A man, fifty-five years of age, suffered from a syphiloma of the tongue. Local treatment with the ferric chlorid, silver nitrate, the actual cautery and ordinary syphilitic treatment gave negative results, and injections were commenced. After twenty-four the improvement was so marked that a permanent cure seemed certain.

CASE III.—The patient had stenosis of the bronchi, due to syphilis, and there were severe attacks of suffocation, resembling asthma. The attacks have since disappeared after a short course of injections.

Baccelli tried intravenous injections in several cases of erysipelas with success, as follows:

CASE IV.—The patient had erysipelas of the gluteal region, and was subjected to intravenous injections of the standard solution in the ordinary manner, with a resultant cure in four days.

CASE V.—In a case of erysipelas of the face a cure was effected in three days by intravenous injections.

R. Jemma, of Genova, reports the following cases:¹

CASE VI.—A man, thirty-eight years old, suffered from cerebral symptoms of one year's duration, the most prominent of which were a general pseudo-paralysis, Romberg's symptom, and diminution of sight and hearing on both sides. Seventy-five injections were given. His general state was markedly improved. The former weakness and

¹ *Riforma Med.* Napoli, 1893, ix, pp. 3, 159-163. *Cronaca de Clin. Med.*, di Genova, 1892-93, 266, or *Boll. di R. Accad. Med.* di Genova, July, 1893.

pain disappeared. The patient walked without the aid of a stick. The sight and hearing steadily improved and were progressing toward recovery. He was yet under treatment.

CASE VII.—The patient was a man, thirty-one years of age, who contracted syphilis three years previously to applying for treatment. On application he showed symptoms of cerebral syphilis, the most prominent being daily epileptiform convulsions. Beginning with 0.001 g. of the salt and increasing to 0.003 g., twenty injections were made. After the first injection the improvement was marked. The convulsions decreased, and at the time he left the clinic the man had not had a convulsion for eight days. His power of speech improved daily, and a cure was expected. Previously to the injections inunctions of mercury and large doses of potassium iodid had proved of no avail.

CASE VIII.—A woman, twenty-five years of age, had contracted syphilis four years previously, and on presentation at the clinic was suffering with constitutional symptoms. Among these were oligemia and multiple neuritis. She had been confined to bed for some time, and had resisted all treatment. Mercurial inunctions and large doses of potassium iodid resulted negatively. Intravenous injections of mercuric chlorid were administered, and improvement was almost immediate. She left the clinic greatly improved.

CASE IX.—A man, twenty-seven years of age, contracted syphilis one year previously, and was suffering from constitutional symptoms and syphilitic adenopathy, together with the pains of neuritis. Sixty injections were given and were followed by steady improvement. The pains disappeared, and the ganglionic tumefaction diminished. The patient was still under treatment.

Dr. Jemma also employed intravenous injections of mercuric chlorid in six cases of typhoid fever, one of rheumatism, one of erysipelas and one of tuberculosis, but had purely negative results. One of the typhoid cases improved after the injection, but there was no influence on the temperature.

M. A. Dagnino,¹ in the clinic of Secondi, of Milan, reports the case of a man, twenty-three years of age, suffering from syphilitic iritis, showing pinkish-yellow nodules on the iris, who was cured in thirteen days, using in all 0.032 g. of mercuric chlorid. P. Colombini² has treated eighteen cases with varying degrees of improvement. In some cases, however, the treatment was suspended on account of salivation or diarrhea. Dr. Antonio Nieddu³ has reported seven cases, all of which have shown great improvement. In fact he says that after four or five injections improvement was marked, and ultimate good results were invariably obtained.

The disadvantages of the older methods of medication in syphilis are well known to every one. Thorough exposition of the hypodermic injections has been made by the papers of Dr. Wolff, Dr. J. William White, and others, and it may be advisable to present the merits of the injections proposed in the treatment of syphilis and to give the reasons that I consider valid for and against their use :

1. There is absolute certainty of absorption, which cannot be obtained by hypodermic or other methods.
2. There is no pain to speak of. Intra-muscular

¹ *Gazetta Deg. Osped. e Del. Clinic*, 1894.

² *Atti della R. Acad. de fis in Siena*. iv, vol. v.

³ *Gior med. del R. Marina*, Nov. 1893.

and hypodermic injections are very painful. The subconjunctival injections in the treatment of syphilitic iritis are impracticable on account of the pain. This method is as successful with no pain. Not a single patient of all those reported has objected to the treatment. In using the hypodermic treatment it is not possible to use any local anesthetic successfully.

3. There is no disturbance of the digestive tract during treatment. In fact, a slight salivation and diarrhea, temporary only, are the only local disturbances reported.

4. There is more rapid absorption and therapeutic effect than by any other method.

5. Less of the mercurial salt is required.

6. Absolute exactitude of dosage can be obtained, which is a rational necessity. Owing to variations in absorption, this is the only method that offers this advantage.

7. It seems to be completely safe; not one accident has been recorded.

8. It is perfectly reliable. All cases reported have shown some improvement, and never any retrogression.

9. Abscesses are absent. These cannot always be avoided in the hypodermic method.

10. There are no dermal irritations or eruptions, such as follow friction or inunctions.

11. The hysteric or nervous symptoms sometimes associated with the hypodermic method are never observed with the intravenous injections.

12. It is successful often when all other methods fail.

13. There is no history of recurrence after a cure.

14. Mercuric chlorid has a preservative action on the red blood-corpuscles, and hence must be valuable intravenously in such a disease as syphilis, in which there is a strong tendency toward destruction of the red blood-corpuscles and subsequent anemia.

The objections offered to the intravenous method may be summarized as follows:

1. In the early stages of syphilis the lesions are in the skin and connective tissue, and, therefore, intravenous injections do not offer the most immediate and satisfactory method of medication.

2. Syphilitic gummata have no vascular supply, and the intravenous injections do not directly reach them. Despite this fact, it is more than probable that the gummata are influenced by mercurial medication as rapidly by the intravenous injections as by any other method.

3. There is a belief that mercuric chlorid, intravenously, has only a temporary action, being quickly eliminated, necessarily making the treatment longer in such a case than with hypodermic injections of solutions of insoluble salts (Columbini).

While it is true that insoluble salts are eliminated more slowly than the soluble, and hence have a more permanent effect, yet observation of the relative merits of soluble and insoluble mercuric salts has shown that mercuric chlorid has a decided preference and gives the most satisfactory results generally. Dr. Wolff's communications verify the foregoing statement. This is most likely due to the rapid absorption and action of the drug in contra-

distinction to the slow and uncertain absorption of the insoluble salts. Uncertain elimination and absorption are always unsatisfactory factors to deal with in therapeutics, and complicate any attempt at definite and scientific treatment.

The disadvantages of the intravenous injections are as follows :

1. The needle may not reach the vein ; but this can be remedied by applying the needle first and awaiting the appearance of a few drops of blood.

2. Some of the blood may extravasate into the subcutaneous tissue, adjacent to the point of injection ; but this has been of very rare occurrence, and the blood is soon absorbed.

3. There is likely to be a slight stomatitis at first.

4. There is the appearance of albumin in the urine after the injections, which, however, is also often resultant on the hypodermic administration.

5. There is, as in all intravenous injections, a subsequent polyuria and increase of urea, but neither has any special disadvantage.

6. During the injection, through a reflex action on the circulatory center, fainting may supervene, but is of no vital import.

7. Jemma has seen slight salivation immediately after the injection of small doses. This is liable to happen in any administration of mercury.

CONCLUSION. The advantages shown so far overbalance the objections that, viewing the present status of treatment, we can but accept this as the most successful at our hands. However, I would not advocate it in cases easily amenable to ordinary treatment or in the early stages of syphilis, but consider it of especial

value in the obstinate cases, resisting other treatment, or in advanced cases of organic syphilis, or when immediate relief is peremptory by reason of pain, encroachment on a vital part, or rapid destruction of tissue. Investigation may prove it to be most valuable immediately after the diagnosis is made, eliminating or destroying the syphilitic virus before it has produced any decided effect on the general system. At present there is no evidence to warrant this statement ; but, as the method is virtually devoid of dangerous or untoward results, it should be given some trial in the beginning of the disease. When the disease is modified by the intravenous injections, it is very probable that the treatment may be continued successfully by the common methods.

Viewing the brilliant results in the cases reported, it would seem that this method is a most valuable one, and one which, in the hands of careful practitioners, will render all forms of this dreadful and everlasting scourge readily curable. It certainly deserves careful study and thorough trial in the hands of American physicians. I should be glad to receive any communications relative to this subject, and trust the method will be given thorough test and discussion.

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